

DOK Levels for the Sample Science Assessment Items

Grade 8 Items:

- 1) Level 1. This item assesses “the recall of information such as a fact or definition.”
- 2) Level 2. This item has several steps and requires some decision making. Students must decide appropriate intervals for measuring pulse and procedures for graphing data. “Level 2 activities include making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.”
- 3) Level 4. An example in the Level 4 definition is “Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions.” This item requires students to perform the breadth of activities an actual scientist would perform and demands extended time and thought.
- 4) Level 3. If this did not require an explanation, it would be Level 1. But here students must explain the complex connection between electrical consumption and production of heat in order receive full credit. “In most instances, requiring students to explain their thinking is at Level 3.”
- 5) Level 1. Even though this item has multiple steps, the steps are not interrelated and do not increase the item’s cognitive demands. Each step involves only recall.
- 6) Level 3. Explaining a simple and short answer can be Level 2, but the explanation required here is much more involved. The rubric requires giving full credit only if the student response “names the highest animal on the food chain, the heron, as having the greatest concentration of the pesticide.” In addition, the response must demonstrate an understanding of biological magnification by explaining that the heron accumulates the greatest concentration of the pesticide from the fish it eats because the fish have accumulated the pesticides from the organisms they have eaten.”

High School Items:

- 7) Level 3. Although it is uncommon, it is possible for a multiple choice item to be at Level 3. This item employs demanding reasoning, because it requires the student to make a complex inference based on an unfamiliar theory.
- 8) Level 3. Like the previous item, this involves making complex inferences from two conflicting theories. This non-routine problem also requires “drawing conclusions from observations” and “explaining phenomena in terms of concepts.”

9) Level 2. Students must at least apply knowledge of controlled-experiment design to this situation, or derive it from the choices offered.

10) Level 2. If this item was open-ended, asking what conclusions could be drawn from the data and why, then it would be Level 3. Here the student only needs to check which of the presented solutions is most reasonable, which requires no decision-making or creativity.

11) Level 1.

12) Level 3. This is another example of a multiple-choice item that is still Level 3, this time due to the complexity of the presented situation. Students must compare the interaction of two dependent variables and interpret the data in light of a complex body of interrelated concepts.